PEMANFAATAN BIJI NYAMPLUNG (*Calophyllum inophyllum L*) SEBAGAI BAHAN BAKU BIODIESEL DENGAN VARIASI SUHU DAN WAKTU PADA PROSES TRANSESTERIFIKASI

Oleh:
Sinta Trisnawati
NIM 14307141004

ABSTRAK

Penelitian ini bertujuan untuk mengetahui: 1) Rendemen biodiesel hasil proses transesterifikasi. 2) Karakter biodiesel yang dihasilkan pada variasi suhu dan waktu transesterifikasi meliputi spektra IR, massa jenis, viskositas, bilangan asam, kadar air, dan kalor pembakaran. 3) Kesesuaian karakter bidoesel menurut SNI 7182:2015

Miyak biji nyamplung yang diperoleh dari pengepresan dihilangkan getahnya dengan metode *degumming*, kemudian dilanjutkan reaksi esterfikasi untuk menurunkan kadar asam lemak bebas. Selanjutnya dilakukan reaksi transesterifikasi menggunakan metanol dan KOH dengan perbandingan minyak:metanol 1:12 b/b pada berbagai harga lama waktu pengadukan dan suhu reaksi transesterifikasi yaitu 60, 120 menit, dan 45, 55, 65˚C. Biodiesel yang diperoleh dianalisis menggunakan spektrofotometer IR dan diuji dengan beberapa parameter yang meliputi massa jenis, viskositas, bilangan asam, kadar air, dan kalor pembakaran.

Hasil penelitian menunjukkan bahwa rendemen biodiesel B_A, B_B, B_C, B_D, B_E, B_F sebesar 69,5; 69,75; 71,7; 54; 65,15; dan 66,5%. Massa jenis sebesar 891,88; 888,07; 887,12; 894,48; 889,14; dan 887,87 kg/m^3. Viskositas sebesar 11,464; 7,892; 5,913; 7,949; 6,292; dan 4,676 cSt. Bilangan asam sebesar 0,4475; 0,4525; 0,2339; 0,3450; 0,2721; dan 0,2721 mg-KOH/g. Kadar air sebesar 0,116; 0,004; 0,022; 0,131; 0,003; dan 0,003%-vulome. Kalor pembakaran sebesar 9333,949; 9569,198; 9186,262; 9280,051; 9070,293; dan 9206,958 kal/g. Dari keenam biodiesel dan minyak biji nyamplung mengandung gugus fungsi yang mirip. Kesesuaian karakter biodiesel dengan SNI 7182:2015 terdapat pada bilangan asam untuk semua biodiesel dan viskositas untuk biodiesel B_F, akan tetapi massa jenis dan kadar air biodiesel B_A dan B_D belum memenuhi standar. Serta nilai kalor pembakaran semua biodiesel juga belum memenuhi standar SNI.

Kata kunci: lama pengadukan, minyak biji nyamplung, minyak biodesel, suhu, transesterifikasi

USING NYAMPLUNG SEED (*Calophyllum inophyllum L*) AS BIODIESEL RAW MATERIAL AT VARIOUS TEMPERATURE AND TIME IN TRANSESTERIFICATION PROCESS

By:
Sinta Trisnawati
NIM: 14307141004

ABSTRACT

The aims of this research were to determine: 1) yield biodiesel from transesterification process . 2) The caracter of biodiesel produced at temperature and time variation transesterification process include: spectra infra red, density, viscosity, acid value, moisture content, and heat of combustion. 3) Suitability of biodiesel character according to SNI 7182:2015.

The nyamplung seed oil obtained from the pressing was removed the sap by *degumming* method, then continued esterification reaction to lower free fatty acid. Transesterifiers were carried out using methanol and KOH with a ratio of oil:methanol 1:12 w/w at various strirring time: 60, and 120 min, and temperature transesterification reaction is 45, 55, 65˚C. The biodiesel product was chacarterized by spectrofotometri infra red and characterized that include density, viscosity, acid value, moisture content, heat of combustion.

The result of the research showed that yield biodiesel of B_A, B_B, B_C, B_D, B_E, B_F 69.5, 69.75, 71.7, 54, 65.15, and 66.5%. Density: 891.88, 888.07, 887.12, 894.48, 889.14, and 887.87 kg/m^3. Viscosity: 11.464, 7.892, 5.913, 7.949, 6.292, and 4.676 cSt. Acid number: 0.4475, 0.4525, 0.2339, 0.3450, 0.2721, and 0.2721 mg-KOH/g. Moisture content: 0.116, 0.004, 0.022, 0.131, 0.003, and 0.003 %-vulome. And heat of combustion: 9333.949, 9569.198, 9186.262, 9280.051, 9070.293, and 9206.958 cal/g. From the all biodiesel dan nyamplung seed oil contains a similar functional group. Suitable of biodiesel characterized compared to SNI 7182:2015 found in acid value for all biodiesel and viscosity for biodiesel B_F, but for density and moisture content of biodiesel B_A dan B_D were not suitable with SNI. Heat of combustion for all biodiesel were not suitable SNI.

Keywords: time of procces. nyamplung seed oil. biodiesel oil. temperature. transesterification